

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

|                                  |   |                             |
|----------------------------------|---|-----------------------------|
| In re Patent Application of      | ) | <b>Mail Stop AMENDMENT</b>  |
| Olivier Larcher et al.           | ) |                             |
| Application No.: 10/568,853      | ) | Group Art Unit: 1793        |
| Filed: August 9, 2006            | ) | Examiner: Anthony J. Zimmer |
| For: COMPOSITION BASED ON CERIUM | ) | Confirmation No.: 6966      |
| OXIDE AND ON ZIRCONIUM OXIDE     | ) |                             |
| HAVING A HIGH REDUCIBILITY AND   | ) |                             |
| HIGH SPECIFIC SURFACE, METHODS   | ) |                             |
| FOR THE PREPARATION THEREOF      | ) |                             |
| AND USE AS A CATALYST            | ) |                             |

**DECLARATION PURSUANT TO 37 C.F.R. §1.132  
OF EMMANUEL ROHART, PhD**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

1. I, Emmanuel Rohart, declare the following:
2. I, Emmanuel Rohart, am a citizen of France.
3. I received a PhD from the University of Poitiers (France) for my studies in the field of chemistry.
4. I have been employed by Rhodia from 1997 to the present. I am currently engaged in research and development in the field of catalysts, especially for automotive applications. I have also worked as an engineer in charge of catalyst applications, and as a project manager for the development of oxides for automotive catalysts.

5. I am familiar with the subject matter of the above-identified U.S. patent application, including the content of claim 16 currently contained therein:

*16. A composition based on cerium oxide and on zirconium oxide in a Ce/Zr atomic proportion of at least 1, exhibiting a level of reducibility of at least 70%, and a specific surface of at least 15 m<sup>2</sup>/g after calcining at least one at a temperature of at least 850°C.*

6. I am familiar with the subject matter of the above-identified U.S. patent application, including the content of claim 38 currently contained therein:

*38. A composition based on cerium oxide and on zirconium oxide in a Ce/Zr atomic proportion of at least 1, exhibiting a level of reducibility of at least 70%, and a specific surface of at least 15 m<sup>2</sup>/g after a first calcination step at a temperature of at least 850°C, and after a second calcination step at a temperature of at least 400°C .*

7. I have reviewed U.S. Patent Application Publication No. 2002/0115563 to Blanchard et al. (hereafter "Blanchard") cited against the above claims 16 and 38 by the U.S. Patent Office.

8. I understand that it has been alleged by the U.S. Patent Office that the Blanchard "composition appears to be the same as that instantly claimed because the known structure, properties, and composition are the same... Thus, the product of Blanchard would be the same as that instantly disclosed, and would exhibit the same properties when exposed to calcination steps as described in the claims."

9. I do not agree that the claimed properties, when exposed to calcination steps of claims 16 and 38, are inherent to the composition disclosed by Blanchard.

10. For instance, Blanchard's Example 1 concerns a process where an initial liquid mixture of cerium and zirconium salts are subsequently submitted to a heat treatment, also known as thermal hydrolysis at 150°C. The mixture of

cerium/zirconium hydroxide or oxyhydroxide which is obtained is shaped by extrusion, dried and calcined.

11. In Blanchard's Example 2, a mixture of cerium and zirconium hydroxide or oxyhydroxide is obtained by a similar process to that of Example 1, but Example 2 concerns a composition with a high content of zirconium since the Ce/Zr ratio is 0.17/0.83, which is lower than 1.

12. Blanchard's Example 3 corresponds to a process which is described in paragraph [0061]. The precipitation with the base takes place in the presence of bicarbonate and under conditions such that the pH of the reaction mixture remains neutral or basic.

13. When compositions with a Ce/Zr atomic ratio of at least 1, such as those in Blanchard's Example 1, are synthesized by a process wherein an initial liquid mixture of cerium and zirconium salts is subsequently submitted to a heat treatment at about 150°C and the precipitate is calcinated at 900°C under air, then the calcinated product presents a level of reducibility which is at most 58%. The shaping of the product by extrusion, as in Blanchard, cannot modify intrinsic properties such as the surface area or the reducibility of the composition.

14. When compositions with a Ce/Zr atomic ratio of at least 1, such as those in Blanchard's Example 3, which are prepared by precipitation with a base in the presence of bicarbonate under conditions such that the pH of the reaction mixture remains neutral or basic. The precipitate, after calcination at 900°C under air, presents a level of reducibility of at most about 46%. The shaping of the product by extrusion, as in Blanchard, cannot modify intrinsic properties such as the surface area or the reducibility of the composition.

15. Thus, the level of reducibility for compositions prepared according to Blanchard's Examples 1-3 and having a Ce/Zr atomic ratio of at least 1, the level of reducibility is much lower than that recited in claims 16 and 38. The shaping of the product of Blanchard's Examples 1-3 by extrusion cannot modify intrinsic properties such as the surface area of the reducibility of the composition.

16. It is clear from the above results that compositions formed according to the teachings of Blanchard do not necessarily possess a cerium/zirconium ratio greater than one, as well as a specific surface of at least  $15 \text{ m}^2/\text{g}$  and a reducibility of at least 70% after calcining at least once at a temperature of at least  $850^\circ\text{C}$  as set forth in claim 16.

17. It is clear from the above results that compositions formed according to the teachings of Blanchard do not necessarily possess a cerium/zirconium ratio greater than one, as well as a specific surface of at least  $15 \text{ m}^2/\text{g}$  after a first calcination step at a temperature of at least  $850^\circ\text{C}$ , and after a second calcination step at a temperature of at least  $400^\circ\text{C}$  as recited in claim 38.

18. I further declare that all statements made herein of my own knowledge are true and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful statements may jeopardize the validity of the application or any patent issuing thereon.

Date: The 21<sup>st</sup> of  
October 2010

By: \_\_\_\_\_

  
Emmanuel Rohart